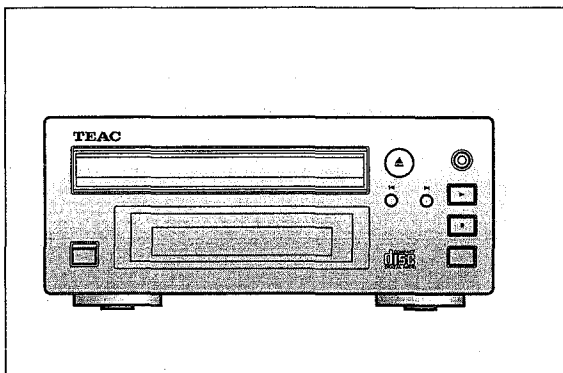# TEAC

SERVICE MANUAL

PD-H300

Compact Disc Player

NOTES

- PC boards shown are viewed from parts side.
- The parts with no reference number or no parts number in the exploded views are not supplied.
- As regards the resistors and capacitors, refer to the circuit diagrams contained in this manual.
- ⚠ Parts marked with this sign are safety critical components.
  They must be replaced with identical components- refer to the appropriate parts list and ensure exact replacement.
- Parts of [ ] mark can be used only with the version designated.
  [E]: EUROPE

CONTENTS

Specifications

Laser System   : 3-beam laser
Digital Filter   : 8-times oversampling
Frequency Response : 20Hz-20,000Hz ($\pm$2dB)
Error Correction Method :
    Cross Interleave Reed-Solomon code
S/N Ratio   : More than 96dB
                     (IHF "A" Filter used)
T.H.D   : Less than 0.02% (1kHz)
Output Voltage   : 2V RMS
Power requirements : 230V, 50Hz [EUR]

Power Consumption : 10W [EUR]
Dimensions (W$\times$H$\times$D) : 215$\times$85$\times$275mm
Weight   : 2.8kg

Standard accessories
Remote control cord ····················1
Signal cord ·························1

* Improvements may result in specification or
   feature changes without notice.

IC PIN DESCRIPTION
IC13 BVIANAM 1232C (μ-COM)

PIN NO.	SYMBOL	I/O	DESCRIPTION
1	VDD		+5V POWER SUPPLY PIN
2	F_MOTOR	O	MECHANISM OPEN CONTROL OUTPUT PIN
3	R_MOTOR	O	MECHANISM CLOSE CONTROL OUTPUT PIN
4	NC		
5	NC		
6	NC		
7	NC		
8	TEST	I	OPTION (LOW=TEAC)
9	NC		
10	SQCK	O	SUBCODE-Q DATA CLOCK OUTPUT PIN
11	SQSO	I	SUBCODE-Q DATA SERIAL INPUT PIN
12	NC		
13	SCOR	I	SUBCODE SYNC SIGNAL (S0+S1) INPUT PIN
14	OP/SW	I	OPEN SWITCH CHECK INPUT PIN
15	CL/SW	I	CLOSE SWITCH CHECK INPUT PIN
16	NC		
17	NC		
18	NC		
19	NC		
20	NC		
21	NC		
22	GND		
23	GND		
24	VDD		+5V POWER SUPPLY PIN
25	VDD		+5V POWER SUPPLY PIN
26	NC		
27	GND		
28	NC		
29	NC		
30	GND		
31	XIN	I	SYSTEM CLOCK OSCILLATION CRYSTAL INTERFACE INPUT PIN
32	XOUT	O	SYSTEM CLOCK OSCILLATION CRYSTAL INTERFACE OUTPUT PIN
33	RESET		SYSTEM RESET PIN "LOW"=ACTIVE
34	RE_IN	I	REMOCON DATA INPUT PIN
35	BUS_IN	I	REMOCON DATA INPUT PIN
36	BUS_OUT	O	REMOCON DATA OUTPUT PIN
37	SENS2	I	SSP STATUS INPUT PIN
38	SENS	I	DSP STATUS INPUT PIN
39	COUT	I	TRACK COUNT INPUT PIN
40	MUTE	O	AUDIO MUTE OUTPUT PIN
41	CLOCK	O	CLOCK OUTPUT PIN
42	XLAT	O	LATCH OUTPUT PIN
43	DATA	O	DATA OUTPUT PIN
44	F. OK	I	FOCUS OK INPUT PIN
45	GFS	I	FRAME SYNC STATUS INPUT PIN
46	DSP RESET	O	SYSTEM RESET FROM DSP OUTPUT PIN
47	POWER	O	SYSTEM POWER ON/OFF OUTPUT PIN
48	FLT POWER	O	FIP FILAMENT POWER ON, OFF OUTPUT PIN

PIN NO.	SYMBOL	I/O	DESCRIPTION
49	NC		
50	30V		FIP VOLTAGE SUPPLY PIN
51	LED	O	STANDBY LED ON OFF OUTPUT PIN
52	NC		
53	NC		
54	NC		
55	NC		
56	NC		
57	NC		
58	NC		
59	KS_1	O	KEY SCAN OUTPUT PIN
60	KS_2	O	KEY SCAN OUTPUT PIN (NOT USED)
61	KS_3	O	KEY SCAN OUTPUT PIN
62	KS_4	O	KEY SCAN OUTPUT PIN
63	KS_5	O	KEY SCAN OUTPUT PIN
64	KS_6	O	KEY SCAN OUTPUT PIN (NOT USED)
65	KS_7	O	KEY SCAN OUTPUT PIN (NOT USED)
66	KS_8	O	KEY SCAN OUTPUT PIN (NOT USED)
67	P1	O	FIP SEGEMENT SIGNAL OUTPUT PIN
68	P2	O	FIP SEGEMENT SIGNAL OUTPUT PIN
69	P3	O	FIP SEGEMENT SIGNAL OUTPUT PIN
70	P4	O	FIP SEGEMENT SIGNAL OUTPUT PIN
71	P5	O	FIP SEGEMENT SIGNAL OUTPUT PIN
72	P6	O	FIP SEGEMENT SIGNAL OUTPUT PIN
73	P7	O	FIP SEGEMENT SIGNAL OUTPUT PIN
74	P8	O	FIP SEGEMENT SIGNAL OUTPUT PIN
75	P9	O	FIP SEGEMENT SIGNAL OUTPUT PIN
76	P10	O	FIP SEGEMENT SIGNAL OUTPUT PIN
77	P11	O	FIP SEGEMENT SIGNAL OUTPUT PIN
78	P12	O	FIP SEGEMENT SIGNAL OUTPUT PIN
79	P13	O	FIP SEGEMENT SIGNAL OUTPUT PIN
80	P14	O	FIP SEGEMENT SIGNAL OUTPUT PIN
81	P15	O	FIP SEGEMENT SIGNAL OUTPUT PIN
82	P16	O	FIP SEGEMENT SIGNAL OUTPUT PIN
83	1G	O	FIP TIMING SIGNAL OUTPUT PIN
84	2G	O	FIP TIMING SIGNAL OUTPUT PIN
85	3G	O	FIP TIMING SIGNAL OUTPUT PIN
86	4G	O	FIP TIMING SIGNAL OUTPUT PIN
87	5G	O	FIP TIMING SIGNAL OUTPUT PIN
88	6G	O	FIP TIMING SIGNAL OUTPUT PIN
89	7G	O	FIP TIMING SIGNAL OUTPUT PIN
90	8G	O	FIP TIMING SIGNAL OUTPUT PIN
91	KI_8	I	KEY SCAN INPUT PIN
92	KI_7	I	KEY SCAN INPUT PIN
93	KI_6	I	KEY SCAN INPUT PIN
94	KI_5	I	KEY SCAN INPUT PIN
95	KI_4	I	KEY SCAN INPUT PIN
96	KI_3	I	KEY SCAN INPUT PIN
97	KI_2	I	KEY SCAN INPUT PIN
98	KI_1	I	KEY SCAN INPUT PIN
99	P17	O	FIP SEGEMENT SIGNAL OUTPUT PIN
100	NC		

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KA9258D

Pin No.	System	I/O	Description
1	DO1.1	O	DRIVE OUTPUT
2	DO1.2	O	DRIVER OUTPUT
3	DI1.1	I	DRIVE INPUT
4	DI1.2	I	DRIVE INPUT
5	REG		REGULATOR
6	REO	O	REGULATOR OUTPUT
7	MUTE		MUTE
8	GND1		GROUND
9	DI2.1	I	DRIVER INPUT
10	DI2.2	I	DRIVE INPUT
11	DO2.1	O	DRIVE OUTPUT
12	DO2.2	O	DRIVE OUTPUT
13	GND2		GROUND
14	OPOUT	O	OPAMP OUTPUT
15	OPIN(-)	I	OPAMP INPUT(-)
16	OPIN(+)	I	OPAMP INPUT(+)
17	DO3.1	O	DRIVE OUTPUT
18	DO3.2	O	DRIVE OUTPUT
19	DI3.1	I	DRIVE INPUT
20	DI3.2	I	DRIVE INPUT
21	VCC1		SUPPLY VOLTAGE
22	VCC2		SUPPLY VOLTAGE
23	VREF		2.5V BIAS VOLTAGE
24	DI4.1	I	DRIVE INPUT
25	DI4.2	I	DRIVE INPUT
26	DO4.1	O	DRIVE OUTPUT
27	DO4.2	O	DRIVE OUTPUT
28	GND 3		GROUND

CXA1992BR (RF AMP+Servo signal processor)

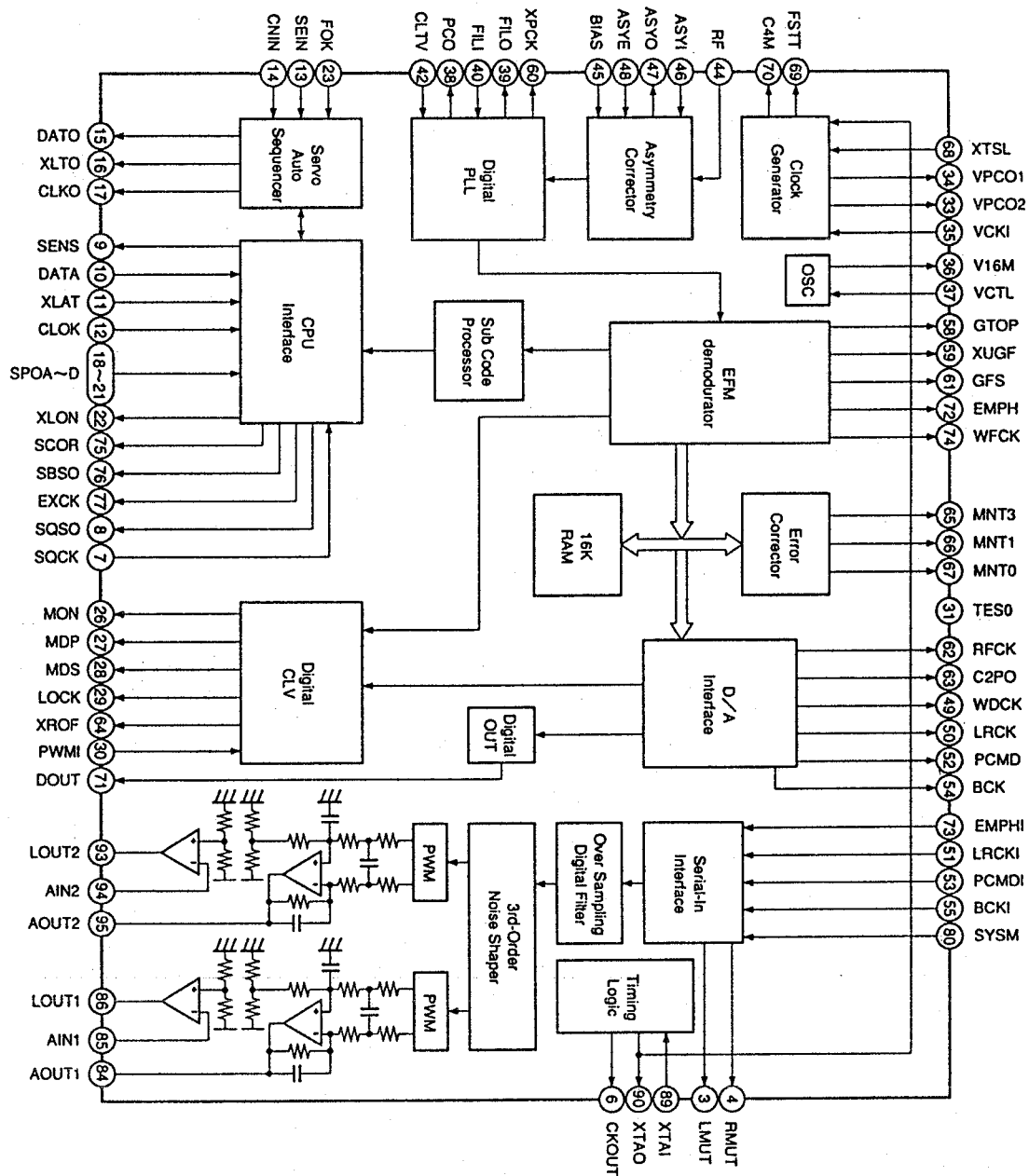| No.	SYMBOL	I/O	DESCRIPTION
1	FEO	O	Focus error amplifier output. Connected internally to the window comparator input for bias adjustment.
2	FEI	I	Focus error input.
3	FDFCT	I	Capacitor connection pin for defect time constant.
4	FGD	I	Ground this pin through a capacitor for cutting the focus servo high-frequency gain.
5	FLB	I	External time constant setting pin for boosting the focus servo low-frequency.
6	FE- O	O	Focus drive output.
13	TA- O	O	Tracking drive output.
16	SL- O	O	Sled drive output.
7	FE-M	I	Focus amplifier inverted input.
8	SRCH	I	External time constant setting pin for generating focus search waveform.
9	TGU	I	External time constant setting pin for switching tracking high-frequency gain.
10	TG2	I	External time constant setting pin for switching tracking high-frequency gain.
11	FSET	I	Peak frequency setting pin for focus and tracking phase compensation amplifier.
12	TA-M	I	Tracking amplifier inverted input.
14	SL-P	I	Sled amplifier non-inverted input.
15	SL-M	I	Sled amplifier inverted input.
17	ISET	I	Connect an external capacitance to set the current which determines the Focus search, Track jump, and Sled kick heights.
18	Vcc	I	Positive power supply.
19	LOCK	I	The sled overrun prevention circuit operates when this pin is Low. (no pull-up resistance)
20	CLK	I	Serial data transfer clock input from CPU. (no pull-up resistance)
22	DATA	I	Serial data input from CPU. (no pull-up resistance)
21	XLT	I	Latch input from CPU. (no pull-up resistance)
23	XRST	I	Reset input ; resets at Low. (no pull-up resistance)
24	C. OUT	O	Track number count signal output.
25	SENS1	O	Outputs FZC, DFCT1, TZC, BALH, TGH, FOH, ATSC, and others according to the command from CPU.
26	SENS2	O	Outputs DFCT2, MIRR, BALL, TGL, FOL, and others according to the command from the CPU.
27	FOK	O	Focus OK comparator output.
28	CC2	I	Input for the defect bottom hold output with capacitance coupled.
29	CC1	O	Defect bottom hold output. Connected internally to the interruption comparator input.
30	CB	I	Connection pin for defect bottom hold capacitor.
31	CP	I	Connection pin for MIRR hold capacitor. MIRR comparator non-inverted input.
32	RF- I	I	Input for the RF summing amplifier output with capacitance coupled.
33	RF- O	O	RF summing amplifier output. Eyepattern check point.
34	RF- M	I	RF summing amplifier inverted input. The RF amplifier gain is determined by the resistance connected between this pin and RFO pin.
35	RFTC	I	External time constant setting pin during RF level control.
36	LD	O	APC amplifier output.
37	PD	I	APC amplifier input.
38	PD1	I	RE I-V amplifier inverted input.
39	PD2	I	Connect these pins to the photo diode A+C and B+D pins.
40	FE- BIAS	I	Bias adjustment of focus error amplifier. Leave this pin open for automatic adjustment.
41	F	I	F I-V and EI -V amplifier inverted input.
42	E	I	Connect these pins to photo diodes F and E.
43	EI	—	I-V amplifier E gain adjustment. (When not using automatic balance adjustment)
44	VEE	—	Negative power supply.
45	TEO	O	Tracking error amplifier output. E-F signal is output.
46	LPFI	I	Comparator input for balance adjustment. (input from TEO through LPF)
47	TEI	I	Tracking error input.
50	TDFCT	I	Capacitor connection pin for defect time constant.
48	ATSC	I	Window comparator input for ATSC detection.
49	TZC	I	Tracking zero-cross comparator input.
51	VC	O	(VCC+VEE)/2 direct voltage output.
52	FZC	I	Focus zero-cross comparator input.

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IC PIN DESCRIPTION
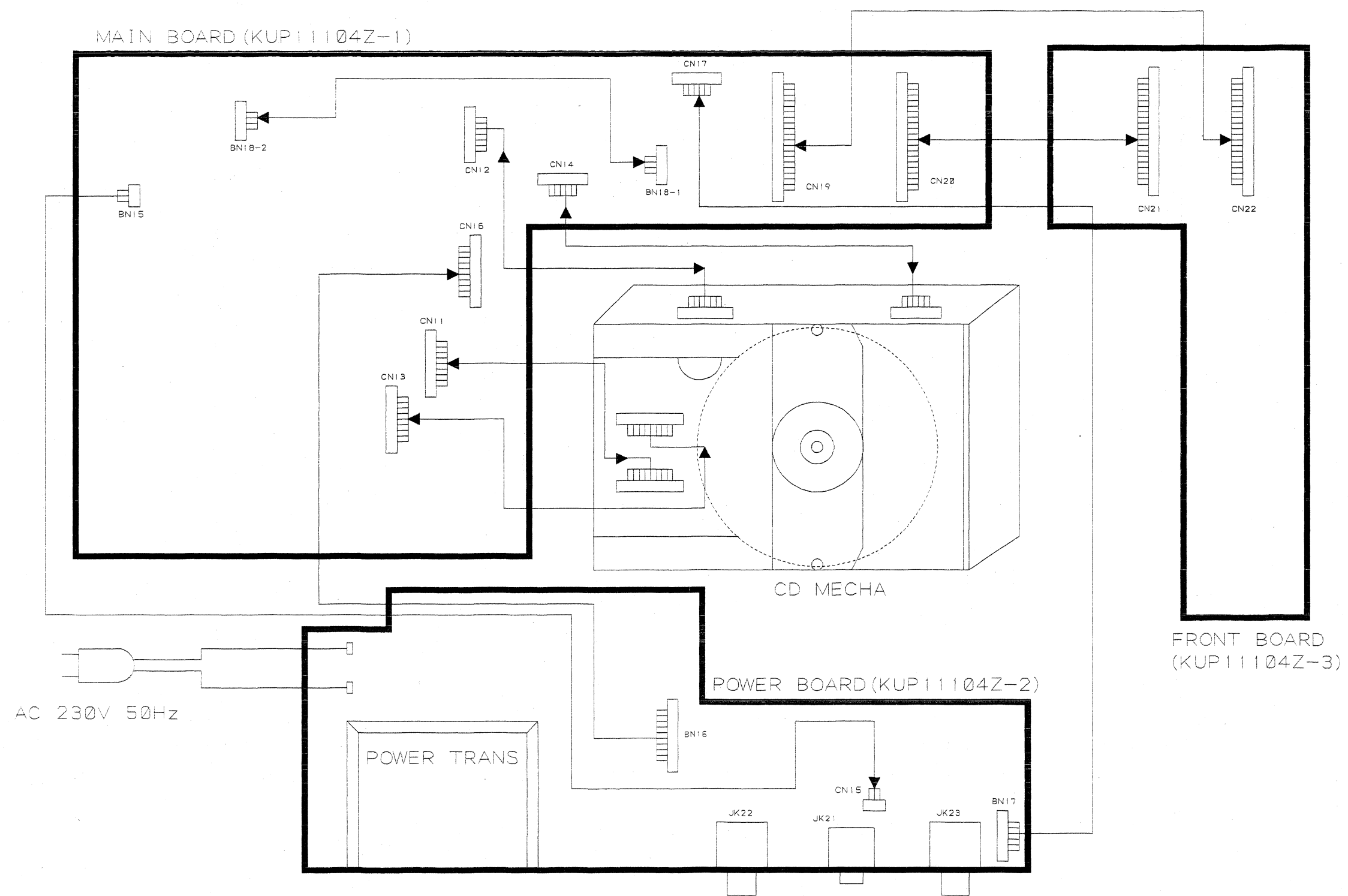## CXD2529Q (Digital Signal Processor)

No.	SYMBOL	I/O		DESCRIPTION
1	V$_{DD}$	—	—	Power supply (+5V).
2	V$_{SS}$	—	—	GND.
3	LMUT	O	1, 0	Left-channel zero detection flag.
4	RMUT	O	1, 0	Right-channel zero detection flag.
5	TES2	O	1, 0	TEST output pin; normally open.
6	CKOUT	O	1, 0	Master clock frequency-divider output. Selects and outputs XTAI × 1, × 1/2, × 1/4 or low only.
7	SQCK	I		SQSO readout clock input.
8	SQSO	O	1, 0	Sub Q 80-bit serial output.
9	SENS	O	1, 0	SENS output to CPU.
10	DATA	I		Serial data input from CPU.
11	XLAT	I		Latch input from CPU. Serial data is latched at the falling edge.
12	CLOK	I		Serial data transfer clock input from CPU.
13	SEIN	I		SENS input from SSP.
14	CNIN	I		Track jump count signal input.
15	DATO	O	1, 0	Serial data output to SSP.
16	XLTO	O	1, 0	Serial data latch output to SSP. Latched at the falling edge.
17	CLKO	O	1, 0	Serial data transfer clock output to SSP.
18	SPOA	I		Microcomputer extended interface (input A).
19	SPOB	I		Microcomputer extended interface (input B).
20	SPOC	I		Microcomputer extended interface (input C).
21	SPOD	I		Microcomputer extended interface (input D).
22	XLON	O	1, 0	Microcomputer extended interface (output).
23	FOK	I		Focus OK input. Used for SENS output and the servo auto sequencer.
24	V$_{DD}$	—	—	Power supply (+5V).
25	V$_{SS}$	—	—	GND.
26	MON	O	1, 0	Spindle motor on/off control output.
27	MDP	O	1, Z, 0	Spindle motor servo control.
28	MDS	O	1, Z, 0	Spindle motor servo control.
29	LOCK	O	1, 0	GFS is sampled at 460Hz; when GFS is high, this pin ouputs a high signal. If GFS is low eight consecutive samples, this pin outputs low.
30	PWMI	I		Spindle motor external control input.
31	TES0	I		TEST pin; normally GND.
32	TES1	I		TEST pin; normally GND.
33	VPCO2	O	1, Z, 0	Wide-band EFM PLL charge pump output. Turned on/off by FCSW of address E.
34	VPCO1	O	1, Z, 0	Charge pump output for wide-band EFM PLL.
35	VCKI	I		VCO2 oscillation input for the wide-band EFM PLL.
36	V16M	O	1, 0	VCO2 oscillation output for the wide-band EFM PLL.
37	VCTL	I		VCO2 control voltage input for the wide- band EFM PLL.
38	PCO	O	1, Z, 0	Master PLL charge pump output.
39	FILO	I	Analog	Master PLL (slave=digital PLL) filter output.
40	FILI	I		Master PLL filter input.
41	AV$_{SS}$	—	—	Analog GND.
42	CLTV	I		Master VCO control voltage input.
43	AV$_{DD}$	—	—	Analog power supply (+5V)
44	RF	I		EFM signal input.
45	BIAS	I		Constant current input of the asymmetry circuit.
46	ASYI	I		Asymmetry comparator voltage input.
47	ASYO	O	1, 0	EFM full-swing output (low = Vss, high = V$_{DD}$)
48	ASYE	I		Low: asymmetry circuit off; high: asymmetry circuit on.
49	WDCK	O	1, 0	D/A interface. Word clock f = 2fs
50	LRCK	O	1, 0	D/A interface. LR clock output f = fs
51	LRCKI	I		LR clock input.

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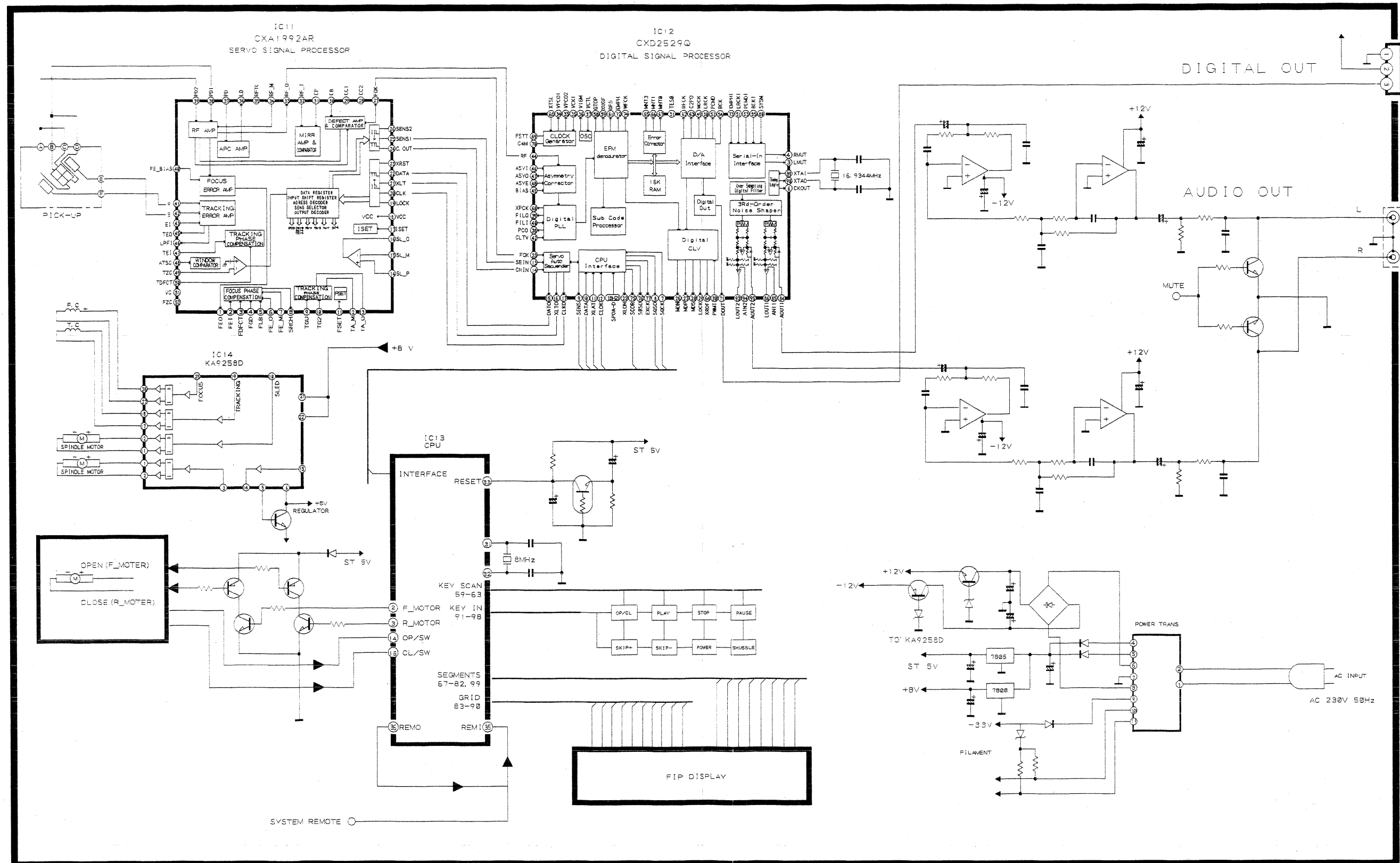| No.	SYMBOL	I/O		DESCRIPTION
52	PCMD	O	1, 0	D/A interface. Serial data output (two's complement, MSB first).
53	PCMDI	I		D/A interface. Serial data input (two's complement, MSB first).
54	BCK	O	1, 0	D/A interface. Bit clock output.
55	BCKI	I		D/A interface. Bit clock input.
56	Vss	—	—	GND.
57	VDD	—	—	Power supply (+5V).
58	GTOP	O	1, 0	GTOP output.
59	XUGF	O	1, 0	XUGF output.
60	XPCK	O	1, 0	XPLCK output.
61	GFS	O	1, 0	GFS output.
62	RFCK	O	1, 0	RFCK output.
63	C2PO	O	1, 0	C2PO output.
64	XROF	O	1, 0	XRAOF output.
65	MNT3	O	1, 0	MNT3 output.
66	MNT1	O	1, 0	MNT1 output.
67	MNT0	O	1, 0	MNT0 output.
68	XTSL	I		Crystal selector input. Low: 16.9344MHz; high: 33.8688MHz.
69	FSTT	O	1, 0	2/3 frequency-divider output for Pins 89 and 90.
70	C4M	O	1, 0	4.2336MHz output. 1/4 frequency-divided VCKI output in CAV-W mode.
71	DOUT	O	1, 0	Digital Out output.
72	EMPH	O	1, 0	Outputs a high signal when the playback disc has emphasis, and a low signal when there is no emphasis.
73	EMPHI	I		Inputs a high signal when de-emphasis is on, and a low signal when de-emphasis is off.
74	WFCK	O	1, 0	WFCK output.
75	SCOR	O	1, 0	Outputs a high signal when either subcode sync S0 or S1 is detected.
76	SBSO	O	1, 0	Sub P to W serial output.
77	EXCK	I		SBSO readout clock input.
78	Vss	—	—	GND.
79	VDD	—	—	Power supply (+5V).
80	SYSM	I		Mute input. Active when high.
81	NC			
82	AVss	—	—	Analog GND.
83	AVDD	—	—	Analog power supply (+5V).
84	AOUT1	O		Left-channel analog output.
85	AIN1	I		Left-channel operational amplifier input.
86	LOUT1	O		Left-channel LINE output.
87	AVss	—	—	Analog GND.
88	XVss			Power supply for master clock.
89	XTAI	I		Crystal oscillation circuit input. Input the external master clock via this pin.
90	XTAO	O		Crystal oscillation circuit output.
91	XVDD			GND for master clock.
92	AVss	—	—	Analog GND.
93	LOUT2	O		Right-channel LINE output.
94	AIN2	I		Right-channel operational amplifier input.
95	AOUT2	O		Right-channel analog output.
96	AVDD	—	—	Analog power supply (+5V).
97	AVss	—	—	Analog GND.
98	NC			
99	NC			
100	XRST	I		System reset. Reset when low.

Notes)
- PCMD is an MSB first, two's complement output.
- GTOP is used to monitor the frame sync protection status. (High: sync protection window released)
- XUGF is the negative pulse for the frame sync derived from the EFM signal. It is the signal before sync protection.
- XPLCK is the inverse of the EFM PLL clock. The PLL is designed so that the falling edge of XPLCK and the EFM signal transition point coincide.
- GFS goes high when the frame sync and the insertion protection timing match.
- RFCK is derived with the crystal accuracy. This signal has a cycle of 136μs (during normal-speed).
- C2PO represents the data error status.
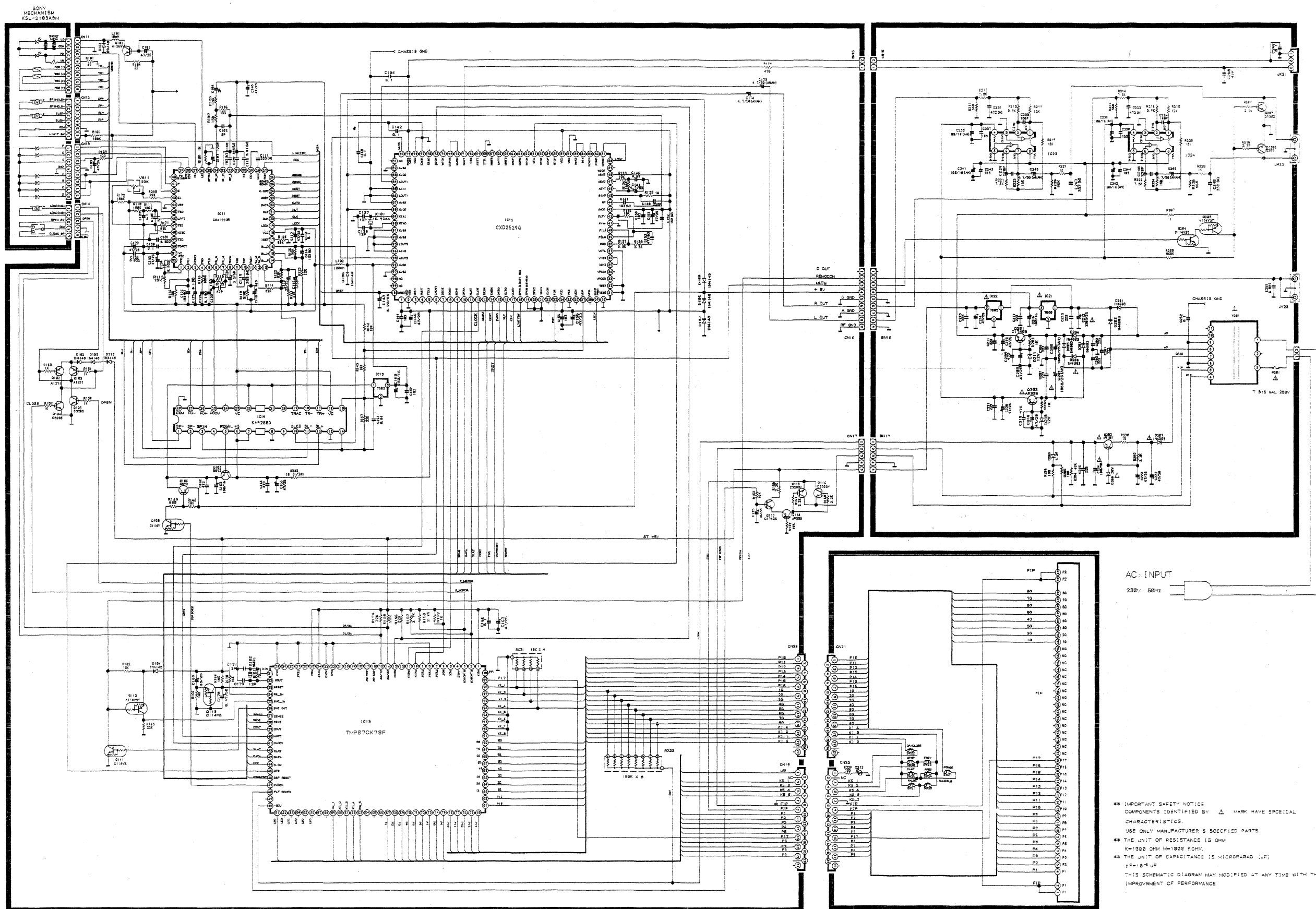- XRAOF is generated when the 16K RAM exceeds the $\pm$4F jitter margin.

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Servo Auto Sequencer · Digital PLL · Asymmetry Corrector · Clock Generator · CPU Interface · Sub Code Processor · EFM demodurator · OSC · 16K RAM · Error Corrector · Digital CLV · D/A Interface · Digital OUT · PWM · 3rd-Order Noise Shaper · Over Sampling Digital Filter · Serial-In Interface · Timing Logic

CNIN 14 · SEIN 13 · FOK 23 · CLTV 42 · PCO 38 · FILI 40 · FILO 39 · XPCK 60 · BIAS 45 · ASYE 48 · ASYO 47 · ASYI 46 · RF 44 · C4M 70 · FSTT 69

DATO 15 · XLTO 16 · CLKO 17 · SENS 9 · DATA 10 · XLAT 11 · CLOK 12 · SPOA~D 18~21 · XLON 22 · SCOR 75 · SBSO 76 · EXCK 77 · SQSO 8 · SQCK 7 · MON 26 · MDP 27 · MDS 28 · LOCK 29 · XROF 64 · PWMI 30 · DOUT 71 · LOUT2 93 · AIN2 94 · AOUT2 95 · LOUT1 86 · AIN1 85 · AOUT1 84

68 XTSL · 34 VPCO1 · 33 VPCO2 · 35 VCKI · 36 V16M · 37 VCTL · 58 GTOP · 59 XUGF · 61 GFS · 72 EMPH · 74 WFCK · 65 MNT3 · 66 MNT1 · 67 MNT0 · 31 TES0 · 62 RFCK · 63 C2PO · 49 WDCK · 50 LRCK · 52 PCMD · 54 BCK · 73 EMPHI · 51 LRCKI · 53 PCMDI · 55 BCKI · 80 SYSM

6 CKOUT · 90 XTAO · 89 XTAI · 3 LMUT · 4 RMUT

WIRING DIAGRAM

MAIN BOARD (KUP11104Z-1)

CN17

BN18-2

CN12 CN14 BN18-1 CN19 CN20

BN15

CN16

CN21 CN22

CN11

CN13

CD MECHA

FRONT BOARD
(KUP11104Z-3)

POWER BOARD (KUP11104Z-2)

AC 230V 50Hz

POWER TRANS

BN16

CN15

JK22 JK21 JK23 BN17

BLOCK DIAGRAM

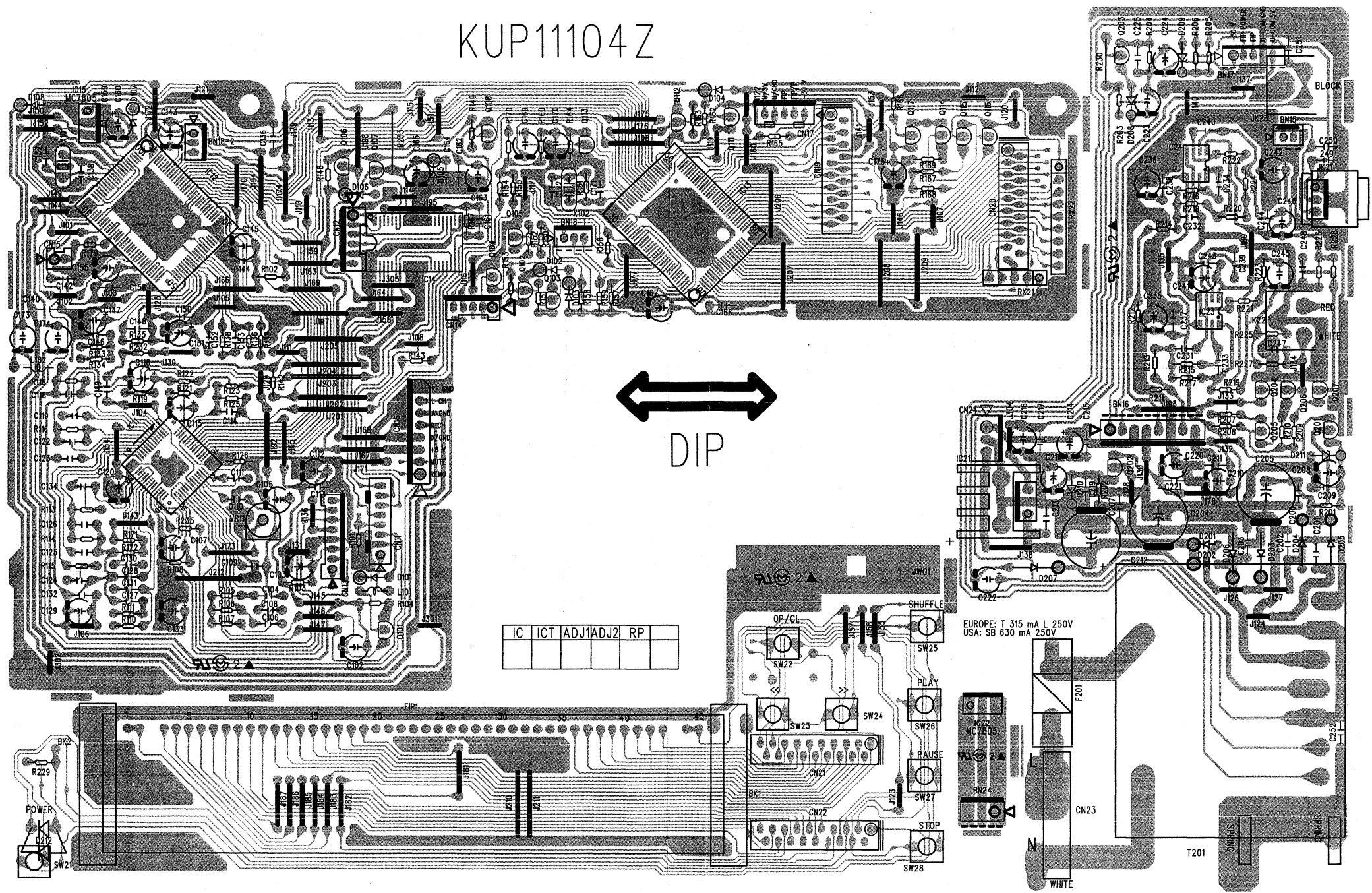# SCHEMATIC DIAGRAM

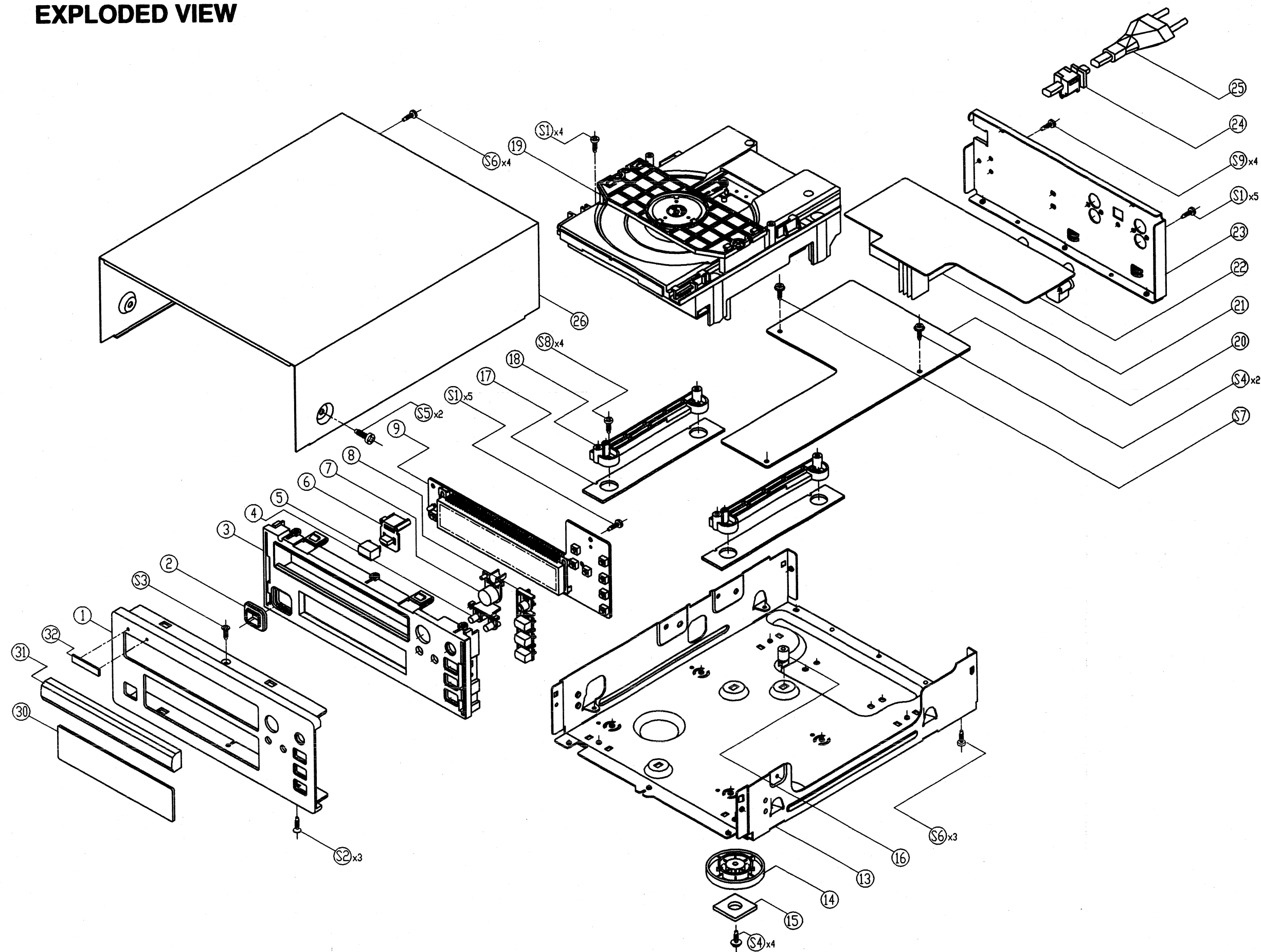# PRINTED CIRCUIT BOARDS

KUP11104Z

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EXPLODED VIEW

EXPLODED VIEW PARTS LIST

Ref. No.	Part No.	Description	Remarks
1	9A06870300	PANEL, FRONT	
2	9A06863300	INDICATOR, STANDBY	
3	9A06831000	PANEL, FRONT	
4	9A06868300	KNOB, CPS	
5	9A06862700	KNOB, STANDBY	
6	9A06862500	KNOB, STANDBY	
7	9A06868200	KNOB, TACT (OPEN/CLOSE)	
8	9A06868400	KNOB, OPERATION	
9		FRONT PCB	
13	9A06871600	CHASSIS, BOTTOM	
14	9A06864400	FOOT	
15	9A05837300	FOOT CUSHION	
16		PCB SUPPORT	
17	9A06241400	RUBBER, SUPPORT	
18	9A06870600	SUPPROT, MECHA	
20	9A06871700	PCB MAIN	
21		TRANS	
22		POWER PCB	
23	9A06870200	PANEL, REAR	
24	9A06754900	BUSHING, AC CORD	
25	9A05328100	CORD, POWER	
26	9A06870100	CABINET, TOP	
30	9A06240500	WINDOW 1A154Y	
31	9A06869300	ORNAMENT, TRAY	
32	9A06224200	BADGE, TEAC	
S1	9A01377400	SCREW, KTB3+10G	
S2		SCREW KTS3+6J	
S3	9A06866000	SCREW KTS3+8G	
S4	9A05339200	SCREW, KTW3+8J	
S5	9A05338800	SCREW KTB4+6F	
S6	9A01535800	SCREW, KTB3+8J	
S7		SCREW, KTW3+10G	
S8	9A06241200	SCREW, SPECIAL	
S9		SCREW, KTB3+6F	

ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
IC11	9A06867800	I.C, SSP CXA1992BR		9A06830400	CD, MECHANISM ASS'Y
IC12	9A06867900	I.C, DSP CXD2529Q	BN11	9A06872100	MECHA WIRE ASS'Y
IC13	9A06867700	I.C, MICOM	BN12	9A06872200	MECHA WIRE ASS'Y
IC14	9A05218500	IC, KA9258D	BN13	9A06872300	MECHA WIRE ASS'Y
IC15	9A05341500	IC, KA7805-ABTU	BN14	9A06872400	MECHA WIRE ASS'Y
Q101	9A05895900	TR, KTA1266YT	T201	9A06830600	TRANS, POWER
Q102, Q103	9A05197200	TR, KTA1271YT	JK21	9A06239100	MODULE, OPTICAL
Q104, Q105	9A06871900	TR, KTC3205YT	JK22	9A06869700	JACK, BOARD
Q106, Q107	9A05219100	TR, 2SB892T	JK23	9A06869800	JACK, IN/OUT (B/B,G)
Q108, Q111	9A05196500	TR, DTC114YST			
Q112	9A05196400	TR, DTA114YST	L102	9A06870400	COIL, CHOCK
Q113	9A05196500	TR, DTC114YST	RX21	9A06871200	RES, NETWORK
Q114	9A05911600	TR., 2SA933SR	RX22	9A06254900	RES, NETWORK SN8X104J
Q115, Q116	9A05197400	TR, KTC3203YT	X101	9A05193100	CRYSTAL, 16934A120C
Q117	9A05939500	TR., 2SC1740SR	X102	9A05193000	CRYSTAL, 08000E160C
			R233	9A05337400	R, CARBON 1/2W 10
D101~D108	9A01390500	DIODE, 1N4148MT	BN15	9A06872500	WIRE ASS'Y
			BN16	9A06872600	WIRE ASS'Y
IC21	9A05976700	IC. ASS'Y	BN17	9A06872700	WIRE ASS'Y
IC22	9A06868000	I.C	BN18	9A06872800	WIRE ASS'Y
IC23, IC24	9A06871800	I.C	BN24	9A06872900	WIRE ASS'Y
				9A06868100	FUSE 2C0315TLE
Q201	9A05939500	TR., 2SC1740SR		9A05328100	CORD, POWER
Q202	9A05911600	TR., 2SA933SR			
Q203	9A05196700	TR, KSA916-Y-SHTA			
Q204	9A05196500	TR, DTC114YST			
Q205	9A05196400	TR, DTA114YST			
Q206, Q207	9A05197500	TR, KTD1302T			
C204, C205	9A06868600	CAP, ELECT			
C212	9A06868800	CAP, ELECT			
D201, D202	9A05194600	DIODE, 1N4003SRT			
D203~D207	9A05194700	DIODE, 1N4003ST			
D208	9A05193700	DIODE, ZENER MTZJ24BT			
D209	9A06236200	DIODE, ZENER MTZJ6.2BT			
D210, D211	9A05359600	DIODE, ZENER MTZJ12BT			
FIT1	9A06238900	F.I.P FIP8DRM7			
SW21~SW28	9A06671200	SW. TACT EVQ21505R			
BN19, BN20	9A06872000	CABLE, CARD			